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A new shrimp sieve

by

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Introduction.

During the last 5 years reports have been published about the problem of undersized fish, destroyed by Dutch shrimpers. Research carried out in 1963 and 1964 showed that more than 1 billion small plaices, about 400 million dabs and a smaller and more variable number of small soles were destroyed annually. The main cause of this terrible loss was the shaking sieve, used on board to sort out the catch.

In 1967, the "Veco Machine Factory" in Colijnsplaat (Neth.) developed a new rotating sieve-type for this purpose. The original design, although far from perfect, promised a solution for many of the worst problems of the shrimp fisheries. The Biological and Technical research-departments of the Ministry of Agriculture and Fisheries cooperated in testing and improving the rotating sieve. After 18 months of experimenting, the final type was introduced in commercial fishing on June 4th 1968.

Differences between both sieves. Technical aspects.

The shaking sieve consists of two flat sieves, one above the other, which move simultaneously with a frequency of 150-200 "beats" per minute. The noise made by this machine is a great nuisance for the crew, especially on trips of several days. The sieve wears out quickly and technical defects occur easily.

The rotating sieve has two co-axial cylindrical sieves, turning around in a tempo of 16 turns per minute, virtually noiseless. The slow, regular movement makes this sieve very durable.

Separation of shrimps and bycatch.

Shaking sieve

The upper sieve of the shaking sieve separates shrimps from bycatch. The sieve is made of wire netting with square openings of one inch². Not only shrimps but also many other round or oblong species, like gobies, pouteels, crabs, smelts and small flatfishes pass easily through these meshes. The bigger flatfishes do not pass through the openings but fall aside. After sieving the flatfish and other bycatch is thrown overboard, dead or fatally wounded by the beats of the sieve. The shrimps are often mixed with mud and the slime rubbed from the epidermis of fishes by the movements of the sieve. The sieve is often clogged by seaweeds and hydroid polypes.

Rotating sieve.

In the rotating sieve the separation of shrimps and bycatch takes place in the inner sieve-cylinder. This sieve consists of round stainless steel bars with a diameter of 12 mm. The slots between the bars are 12,5 mm wide, circular threads in the cylinder divide the slots in openings of 47 mm long. A fuse, with several openings, provides a lot of water on the catch over the whole length of the cylinder. The effective function of the inner sieve is based on the different way in which fish and shrimp move along in the cylinder. The shrimps move, slightly bend, with their back first. If they happen to come between two threads, they are lead to the openings and fall through these because their centre of gravity lies strongly dorsal.

Fishes, moving with their heads first, glide easily over the slots because their centre of gravity lies more or less central. Dabs, plaices and flounders are automatically turned on their backs before being removed, as in this position the fish has no "grip" on the surface of the sieve with its lateral fins.

The fishes and other bycatch that do not pass through the openings of the inner sieve are swept overboard with a large amount of water through a wide flexible tube, virtually undamaged, together with the undersized shrimps which fall through the outer sieve. This cylindrical sieve is not clogged by seaweeds or hydroid polypes, because these are turned into cylindrical rolls and removed too.

Separation of undersized and consumption-shrimps.

Shaking sieve

The lower sieve of this machine is intended to separate undersized from consumption-shrimps. This sieve is made of steel wires with a diameter of 1 mm. Due to inaccurate construction and to the flexibility of the wires, the distance between the threads of the sieve is far from constant: at an average distance of 6.3 mm the variation can be more than 2 mm. If the sieve is in use, the aberrations are even greater, as fish (especially pouteels and gobies) become stuck between the flexible wires and often clogg the sieve. Selection is poor; even with a relatively narrow sieve a constant and serious loss of consumption-shrimps occurs, as they are falling through into the pile of undersized shrimps.

Rotating sieve

The separation of consumption-shrimps from undersized shrimps is carried out in the outer sieve cylinder, consisting of round stainless steel bars with a diameter of 6 mm and an interval of 6.5 mm wide. The construction of this sieve is extremely accurate and robust, aberrations in the width of the intervals have to be expressed in hundreds of millimeters.

The relation between the diameter of the bars and the width of the slots proved to be very important in order to obtain a sharp selection. The sharp selection of the rotating sieve increases considerably the amount of consumption-shrimps obtained from each haul. Small flatfishes which happen to remain between the consumption shrimps are sorted out a second time by a spiral sieve at the end of the outer sieve-cylinder.

Conclusions.

Many problems around the handling of shrimps and undersized flatfishes on board of shrimpboats are solved with the introduction of the rotating sieve. The financial outcome for every shrimper will increase noticeable because of a better quality of consumption-shrimps and of a higher yield out of every haul by better selection. The saving of huge numbers of undersized shrimps and of flatfishes will improve the cutter-fisheries as a whole.

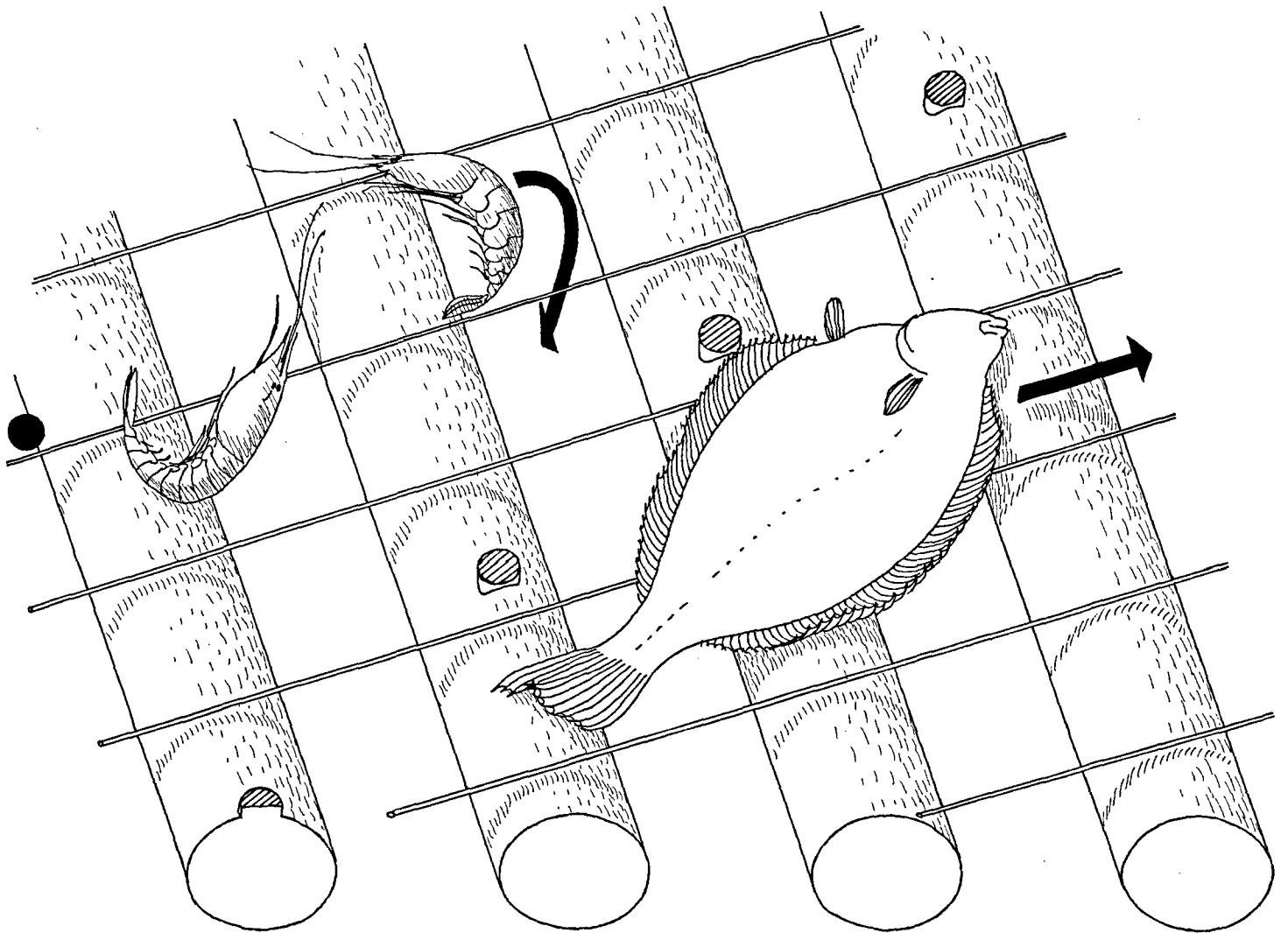
Litterature

Boddeke R. and de Boer E.J.

Garnalenzeven en garnalen zeven.
Visserij 1968, 21, 58-71.

Boddeke R.

Selectie van garnalenzeven: van kansspel
tot precisiewerk.
Visserij 1968, 21, 279-287.



Transport of shrimps and flatfish in the inner sieve cylinder. Shrimps are "guided" through the openings by the threads. Flatfishes are turned on their dark side and subsequently removed.